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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/749,128

12/30/2003

Jaroslaw J. Sydir

INTEL-015PUS

3291

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08/22/2006

Daly, Crowley & Mofford, LLP  
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EXAMINER

CHASE, SHELLY A

ART UNIT

PAPER NUMBER

2133

DATE MAILED: 08/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/749,128

Applicant(s)

SYDIR ET AL.

Examiner

Shelly A. Chase

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21-29 is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

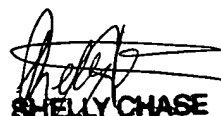
**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

  
**SHELLY CHASE**  
**PRIMARY EXAMINER**

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7-15-2004</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1 to 29 are presented for examination.

#### ***Information Disclosure Statement***

2. The references listed in the information disclosure statement submitted on 7-15-2004 have been considered by the examiner (see attached PTO-1449).

#### ***Claim Objections***

3. Claim 1 is objected to because of the following informalities:
  - i) please change the phrase "a polynomial" to --- a residue --- recited on line 5.Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 1 to 6 and 17 to 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 2 and 17 are deemed indefinite because of the recited phrase "adapted to", please correct for clearer claim language. Claims 3 to 6 and 18 to 20 are also rejected due to their dependency on a rejected base claim.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 2 and 4 to 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshida et al. (USP 6754870 B2).

Claim 1:

**Yoshida** teaches a cyclic redundancy check (CRC) operation unit and a CRC operation method wherein the apparatus comprises: an arithmetic and logic unit (31) ("a CRC unit") for performing CRC calculation; a generating polynomial supply section with a first register (12) ("at least one polynomial storage device") for storing the generating polynomial; and an operation data supply section (21) ("at least one residue storage device") for providing operation data to the arithmetic unit (see fig. 1 and col. 4, lines 20 et seq.). Yoshida also teaches that the arithmetic unit performs CRC calculation on the received polynomial and operation data (see col. 5, lines 9 to 15).

As per claims 2 and 4, Yoshida teaches that the computed CRC is return to the operation unit for storage in the general register (24) (see col. 4, lines 60 to 66) and teaches the CRC operation unit includes a generator polynomial section, an operational

data section and an arithmetic and logic unit ("a plurality of processing contexts") (see fig. 1).

As per claims **5** and **6**, Yoshida teaches that the generating polynomial supply section sets initial data in the first register for the transferred input data of M bits (see col. 5, lines 45 to 55).

8. Claims **7**, **8**, **12** and **13** are rejected under 35 U.S.C. 102(e) as being anticipated by Goyins et al. (USP 6938201 B2).

Claim **7**:

**Goyins** teaches an error detection system that includes CRC generation blocks for detecting errors in a data block, the system comprising: a CRC generation receiving a polynomial associated with the message block frame (see col. 2, lines 15 et seq.) and a CRC remainder (112) is analyzed by the CRC generator (124) (see col. 3, lines 40 et seq.). Goyins also teaches that the CRC generator (124) receives the input data stream (120) from the FIFO (118) wherein the control logic controls the size of the data stream received by the CRC generator (see col. 3, lines 55 to 65). Goyins further teaches that the CRC generator (124) computes CRC for the the received data stream using the appended CRC (112) ("residue") and the polynomial that is used to compute the appended CRC (see col. 3, line 60 to col. 4, line 12). Goyins teaches that a comparator receives the computed CRC from generator (124) and compares the data checking for errors in the block.

As per claim 8, Goyins teaches that control logic (130) indicates to the CRC generator (124) the start of the message block and the end of the message block (see col. 3, lines 60 to 65) and the CRC calculations is performed for data shifting into the data path (see col. 5, lines 52 to 56), which reads on "determining whether there are remaining blocks of data for the packet and when there are remaining blocks of data for the packet then loading the next block of data for the packet and calculating a CRC value for said next block of data."

As per claims 12 and 13, Goyins teaches that the load CRC signal provides an appropriate time when to load the CRC 112 (see col. 4, lines 50 to 54) and a generator polynomial stored in register (302 & 304) is loaded at the appropriate time for CRC computation (see col. 5, lines 10 et seq.).

9. Claims 14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Maa (USP 5878057).

Claims 14 and 16:

**Maa** teaches a CRC generator comprising: a look-up table (LUT) (10) having p locations of k bits (see fig. 1 and col. 3, lines 42 to 56) and a register (22) with a p bit section for storing generator polynomial (see fig. 2 and col. 4, lines 1 to 6). Maa further teaches a parallel XOR tree circuit (14) that includes multiple XOR gates (16) ("single data processors") wherein the XOR circuit receives multiple outputs from the LUT and receives output polynomial from register 22 (see col. 3, lines 52 et seq.). Maa further teaches that the register (22) has a K bit section ("remainder storage element")

supplying output data to the XOR tree circuit (see col.1, lines 50-65 and col. 4, lines 15 et seq.).

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Maa.

As per claim 3, Yoshida does not specifically teach that the CRC operation unit includes an input RAM coupled to the polynomial storage device; however, Maa in an analogous art teaches that a CRC generation device includes a look-up table coupled to a register (22) that stores a polynomial value (see col. 3, lines 52 et seq.). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the CRC device or Yoshida to include the lookup table as taught by Maa since, Maa teaches that a CRC generation device using a look-up table is capable of computing CRC for various data (see col. 4, lines 60 to 68). This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ a CRC generation device that improves the accuracy of CRC computation by computing CRC for various data.

12. Claims **9** to **11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Goyins et al. in view of Maa.

As per claims **9** to **11**, Goyins does not specifically teach calculating a CRC value for said next block of data includes using the residue from a CRC calculation of the prior block of data, neither teaches that initializing the residue to zero or an initial non-zero value is loaded into the residue; however, Maa in an analogous art teaches that computed remainder is used in the CRC computation of the next block (see col. 4, lines 10 to 18 and col. 1, lines 50 to 68). Maa also teaches that the CRC generator performs initialization (see col. 3, lines 35 to 40) and that an value can be applied for n, p and k (see col. 4, lines 25 to 30). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the CRC generation unit of Goyins to include using the partial CRC and applying any value to n, p and k as taught by Maa since Maa teaches that a CRC generation device applying an value to n, p and k is universal (see col 4, lines 25 to 30). This modification would have been obvious because a person of ordinary skill in the art would have been motivated to employ a universal CRC generation device capable of computing CRC for any data as taught by Maa.

13. Claim **15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Maa.

As per claim **15**, Maa teaches that the XOR tree circuit operates on data output from the register and the lookup table; however, Maa fails to teach that the first set of data operated on is the least significant bit (LSB). The use of the LSB is merely a



matter of design choice and would have been obvious in the CRC generator of Maa. The invention as a whole is obvious over the invention of Maa and is not patentably distinct since both the invention and the prior art are computing CRC for a set of bits. Accordingly, it would have been obvious to one of ordinary skill in the art to replace the bits process by the XOR tree to first process LSB since specifying the type of bits to process first would have been a matter of design choice and obvious to one of ordinary skill in the art.

***Allowable Subject Matter***

14. Claims 21 to 29 are allowed.
15. Claims 17 to 20 would be allowable once the 112 second paragraph rejection is overcome.
16. The following is a statement of reasons for the indication of allowable subject matter: the prior art made of record teaches a method and an apparatus for computing CRC using a polynomial and a remainder as detailed above; however, the prior art made of record taken alone or in combination fails to specifically teach or fairly suggest the novel element of the instant invention. I.e., the prior art made of record fails to teach or fairly suggest or render obvious a programmable CRC calculation engine comprising: using a first stage configuration bits to compute an interim CRC and using a second stage configuration bits to determine a CRC value as recited in the independent claims.

***Conclusion***

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelly A. Chase whose telephone number is 571-272-3816. The examiner can normally be reached on Mon-Thur from 8:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on 571-272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
**SHELLY CHASE**  
**PRIMARY EXAMINER**